nearly entire, the proximal and distal extremities of the left tibia and fibula; and a metatarsal bone of the left hind foot.

Before entering upon the description of these remains, a few observations may be advantageously premised on some of the distinguishing characters of the Camelidæ. It is well known that the Camels and Llamas deviate in their dentition, viz., in the presence of two incisors in the upper jaw, from the true Ruminants; and we cannot avoid perceiving that in this particular the direction in which they deviate tends towards the conterminous Ungulate Order, in which incisor teeth are rarely absent in the upper jaw. They also further deviate from the Ruminants and approach the Pachyderms in the absence of cotyledons in the uterus and fetal membranes; having, instead thereof, a diffused vascular villosity of the chorion, as in the sow and mare.

But besides these characters, by which, in receding from one type of hoofed mammalia, the Camelidæ claim affinity with another, there are many parts of their organization peculiar to themselves; of some of these peculiarities, the relation to the circumstances under which the animal exists, can be satisfactorily traced; in others, the connection of the structure with the exigencies of the species, is by no means obvious, and in this predicament stands the osteological peculiarity, which is immediately connected with our present subject—a peculiarity in which the Camelidæ differ not only from the other Ruminants, but from all other existing Mammalia, and which consists in the absence of perforations for the vertebral arteries in the transverse processes of the cervical vertebræ, the altas excepted.

I may observe that what is described as a perforation of a single transverse process in a cervical vertebra is essentially a space intervening between two transverse processes, a rudimental rib, and the body of the vertebra. In the cold-blooded Saurians,—in which the confluence of the separate elements of a vertebra takes place tardily and imperfectly, if at all,—the nature of the so called perforation of the transverse process is very clearly manifested, as in the cervical vertebræ of the Crocodile, in which the interspace of the inferior and superior transverse processes is closed externally by a separate short moveable cervical rib. In the Ornithorhynchus paradoxus the vertebra dentata also preserves throughout life this condition of its lateral appendages: in other Mammalia it is only in the fœtal state that the two transverse processes are manifested on each side with their extremities united by a distinct cartilage, which afterwards becomes ossified and anchylosed to them.

In the Hippopotamus the inferior transverse process sends downwards a broad flat plate extended nearly in the axis of the neck, but so obliquely, that the posterior margins of these processes, in one vertebra, overlap the anterior ones of the succeeding vertebra below, like the cervical ribs in the Crocodile; the same structure obtains in many other mammalia, especially in the Marsupials. In the

Giraffe, the inferior transverse processes are represented by relatively smaller compressed laminæ, projecting obliquely downwards and outwards from the anterior and inferior extremity of the body of the vertebra. The superior transverse processes in this animal are very slightly developed in any of the cervical vertebræ, and the perforation for the vertebral artery is above and generally in front of the rudiment of this process, being continued as it were through the side of the substance of the body of the vertebræ.

In the long cervical vertebræ of the Camel and Llama, the upper and lower transverse processes are not developed in the same perpendicular plane on the sides of the vertebræ, but at some distance from each other; the lower transverse processes (*a*, fig. 1, Pl. VI.; *a*, fig. 1, 3, 4, Pl. VII.) being given off from the lower part of the anterior extremity of the body of the vertebra; the upper ones (*b*, fig. 1, Pl. VI.; *a*, fig. 1, 3, 4, Pl. VII.) from the base of the superior arch near the posterior part of the vertebra, or from the sides of the posterior part of the body of the vertebræ. The extremities of these transverse processes do not become united together, but they either pass into each other at their base, or continue throughout life separated by an oblique groove (as in fig. 1, Pl. VI.) This groove would not, however, afford sufficient defence for the important arteries supplying those parts of the brain which are most essential to life; and, accordingly the vertebral arteries here deviate from their usual course, in order that adequate protection may be afforded to them in their course along the neck. From the sixth to the second cervical vertebræ inclusive in the *Aucheniæ*, and from the fifth to the second inclusive in the *Cameli*,* the vertebral arteries enter the vertebral canal itself, along with the spinal chord, at the posterior aperture in each vertebra, run forwards on the outside of the dura mater of the chord between it and the vertebral arch, and when they have thus traversed about two-thirds of the spinal canal, they perforate respectively the superior vertebral laminæ, and emerge directly beneath the anterior oblique or articulating processes, whence they are continued along with the spinal chord into the vertebral canal of the succeeding vertebra, and perforate the sides of the anterior part of the superior arch in like manner; and so on through all the cervical vertebræ until they reach the atlas, in which their disposition, and consequently the structure of the arterial canals, resemble those in other Ruminants.

The two cervical vertebræ of the Macrauchenia present precisely the struc-

* In the seventh cervical vertebra of the Camel, as in many other Mammalia, there is no perforation in any part for the vertebral arteries. In a Vicugna, I find the same structure; but in a Llama, the side of the body of the seventh cervical vertebra is perforated longitudinally on the right side. In the Camel, the vertebral arteries pierce the sixth cervical vertebra, immediately below the superior transverse processes, and pass obliquely to the anterior aperture of the cervical canal, where they emerge beneath the anterior oblique processes, and then enter the spinal canal of the fifth cervical vertebra, as described in the text.